Proposal # 2001-D202 (Office Use Only)

PSP Cover Sheet (Attach to the front **of** each proposal)

Proposal Title: ***Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinementfor Habitat Enhancement***

Applicant Name: Ducks Unlimited, Inc.
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Amount of funding requested **$231,942**

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost: Same Federal cost: Same

Cost share partners? ___ Yes ___X No
Identify partners and amount contributed by each: Non-Matching FY 2000 - AFRP: $57.465

Indicate the Topic for which you are applying (check only one box).

- Natural Flow Regimes
- Beyond the Riparian Corridor
- Nonnative Invasive Species
- Local Watershed Stewardship
- Channel Dynamics/Sediment Transport
- Environmental Education
- X Flood Management
- Special Status Species Surveys and Studies
- Shallow Water Tidal/ Marsh Habitat
- Fishery Monitoring, Assessment and Research
- Contaminants
- Fish Screens

What county or counties is the project located in? Stanislaus County

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible:

San Joaauin River: 12.1. (Vernalis to Merced)

Indicate the type of applicant (check only one box):

- State agency
- Public/Non-profit joint venture
- Local government/district
- University
- Other:
- Federal agency
- X Non-profit
- Tribes
- Private party

Indicate the primary species which the proposal addresses (check all that apply):

X San Joaquin and East-side Delta tributaries fall-run chinook salmon
Winter-run chinook salmon
Late-fall run chinook salmon
Delta smelt
Splittail
Green sturgeon
White Sturgeon
X Waterfowl and Shorebirds Migratory
Spring-run chinook salmon
Fall-run chinook salmon
Longfin smelt
X Steelhead trout
Striped bass
All chinook species
All anadromous salmonids
American shad
Other listed T/E species: _____

Indicate the type of project (check only one box):

Research/Monitoring
X Pilot/Demo Project
Full-scale Implementation
Watershed Planning
Education

Is this a next-phase of an ongoing project? Yes X No

Have you received funding from CALFED before? Yes X No ___
If yes, list project title and CALFED number:

Project Name:	CALFED Number:
Lower Butte Creek Project: Phase II – Preliminary Engineering and Environmental Analysis for Butte Sink Structural Modifications and Flow-through System	99-BO2
Gomll Dam Fish Screen	96-M22
M & T/Parrott, Pumping Station and Fish Screen	95-M05
Rancho Esquon/Adamas Dam Fish Screen	96-M21
San Pablo Bay NWR, Cullinan Ranch	97-N18
San Pablo Bay NWR, Tolay Creek	97-N19

Have you received funding from CVPIA before? Yes X No ___
If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):

Project Name:	CVPIA Number:
Lower Butte Creek Project, Phase III – Butte Creek, Drumheller Exclusion Barrier Final Engineering, Permitting and Construction	1448-11332-9JOO6
Lower Butte Creek Project, Phase II – Butte Creek, Butte Sink/Sutter Bypass Stakeholder Coordination/Facilitation	113329-9-J135
Lower Butte Creek Project, Phase II – Butte Creek. Sutter Bypass East-West Diversion Dam Preliminary Engineering and Environmental Review	113329-9-5122
Lower Butte Creek Project, Phase II – Butte Creek, Sutter Bypass Weir #5 Preliminary Engineering and Environmental Review	11332-9-J122
Lower Butte Creek Project, Phase II – Butte Creek, Sutter Bypass Weir #3 Preliminary Engineering and Environmental Review	113329-9-J136

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Ducks Unlimited, Inc.
Printed Name of Applicant

Ronald A. Stromstad

B. EXECUTIVE SUMMARY

Non-Structural Alternative at the San Joaquin River National Wildlife Refuge:
Refinement for Habitat Enhancement

Amount Requested: $231,942

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PARTICIPANTS
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Elizabeth S. Andrews, P.E., Principal

COLLABORATORS
San Joaquin National Wildlife Refuge

Project Summary

As a result of the January 1997 floods the San Joaquin River National Wildlife Refuge *(SJRNWR)* is working with the US Army *Corps* of Engineers (COE) to plan non-structural flood management alternative (NSA). This alternative includes breaching existing mainstem San Joaquin River levees on newly acquired refuge land to protect and restore wetland and riparian habitat. This proposed NSA will provide floodplain inundation behind project levees of up to 3,100 acres of refuge land in some years.

This project is a demonstration channel-floodplain reconstruction project. The total NSA project consists of engineering and hydraulic analysis, design refinement, implementation, and monitoring. Phase 1, the development of the original NSA concept and land purchase, has been completed. Phase 2, refinement and implementation of the NSA, is about to begin. It includes project refinement analysis that will be conducted during 2000, in addition to this proposal and a related construction-oriented proposal also being submitted as part of this CALFED PSP 2001. Phase 3 will consist of the monitoring and adaptive management phase.

The effort addressed in this proposal includes hydrodynamic analysis and refinement of the current NSA proposal with respect to the needs of anadromous fish. Specific concerns include the depth, duration, timing, and frequency of floodplain inundation as well as limiting the potential for both stranding and enhancement of conditions supporting predator fish species. The analysis tool that we will use to conduct our effort is the one-dimensional looped-network hydrodynamic model called MIKE 11.

This project will serve two of the six ERP goals: 1) Ecosystem Processes and 2) Biotic Communities and Habitats. Specifically, this project will allow the reconnection of the mainstem San Joaquin River with floodplain lands at the Refuge near the confluence of the Tuolumne River through levee modification. Inundation of the lands will occur in response to high flows on the San Joaquin, probably through levee breaches along the river. This project will improve rearing conditions for juvenile salmonids (fall-run chinook salmon and steelhead), minimize the potential for stranding of these fish species given increased river access to the floodplain, and enhance San Joaquin River foodweb productivity.

C. PROJECT DESCRIPTION

1. Statement of the Problem

a. Problem

As a result of the January 1997 floods the San Joaquin River National Wildlife Refuge (SJRNWR) has been working with the US Army Corps of Engineers (COE) to plan non-structural flood management alternative (NSA). The proposed alternative includes breaching existing mainstem San Joaquin River levees on newly acquired refuge land to protect and restore wetland and riparian habitat. This proposed NSA will provide floodplain inundation behind project levees of up to 3,100 acres of refuge land in some years. The initial focus of the NSA study conducted by the COE (COE 1998) was to identify potential levee breech sites and evaluate potential flooding risk to adjacent landowners.

However, no analysis has been completed to date to support the appropriateness of the currently proposed NSA for support of the project's ecosystem enhancement goals. Concerns include the depth, duration, timing, and frequency of floodplain inundation, as well as limiting the potential for both stranding and enhancement of conditions supporting predator fish species. The COE report, which relied on simple steady-state flow assumptions for water movement through levee breaches during a design flow, specifically did not address any ecosystem restoration aspects of the NSA. In fact, their report specifically stated "... these are the minimum size and number of breaches; additional and larger breaches may be made to accomplish SJRNWR plans." (COE 1998). Instead, the COE analysis was focused on the project's flood management goals.

The proposed work under this proposal will provide that essential information prior to final NSA design and implementation. This proposal may therefore prove essential to the initial success of the NSA as an anadromous fish enhancement project. The effort envisioned by this proposal will build directly on the work product that will be completed as part of Phase 2 during 2000, funded separately, to evaluate the currently proposed NSA configuration for anadromous fish considerations. It will also directly support the final NSA design and implementation effort that is also proposed to occur in Phase 2, and for which a proposal is being submitted to CALFED under this same funding cycle.

b. Conceptual Model

The natural processes driven by seasonal floodplain inundation and disturbance are crucial to the ecological integrity of the river ecosystem (Pinay et al. 1990, Ward and Stanford 1995a, Ward and Stanford 1995b). These aspects of the conceptual model underlying the NSA proposal are more appropriately discussed in the concurrent proposal being submitted by the SJRNWR for NSA implementation.

Inundation of floodplains is thought to benefit anadromous fish directly by increasing food supply to juveniles present in flooded lands, increasing available habitat area, as well as increasing the overall nutrient supply to the river system (Junk et al. 1989). Data collected to date at the Cosumnes River and the Yolo Bypass (Ted Somer, DWR and Keith Whitener, TNC, *personal communication)* have shown the presence of larger individuals on the floodplain compared to the adjacent river; the greater food supply on the floodplain is thought to be responsible. Larger individuals are hypothesized to have a better chance of survival and therefore

success in returning to spawn (Schlosser 1991). Concerns for native fish species associated with reconnection of rivers and floodplains include the stranding of juveniles as flows recede and the creation or enhancement of conditions that support predator fish species.

We hypothesize that modeling inundation conditions in advance of the breaching can help us refine the proposed project to improve expected initial floodplain conditions for anadromous fish. After implementation, monitoring will help us determine how accurately we predicted actual inundation conditions and help to refine our understanding of the actual use of the floodplain by anadromous fish species. Information on the utility and accuracy of the pre-project modeling effort can be developed **through** post-project monitoring and assessment. We expect that post-implementation calibration of the model will also provide an adaptive management tool in the event that problems are identified after implementation, or changes in flow patterns are anticipated. **(As** site conditions at the **NSA** are expected to evolve over time as an essential part of the ecosystem function of this terrestrial-aquatic ecotone -- see, for example, Pinay et al. 1990, Schlosser 1991, Ward and Stanford 1995a, the active manipulation .of **NSA** inundation conditions by earth movement is expected to occur entirely, or almost entirely, only in the initial years of the project.)

Anadromous fish have been identified as using inundated floodplains in certain types of conditions (depth, duration, timing, frequency). Based on the literature and unpublished work at other similar sites in California, specific floodplain inundation conditions that are beneficial to anadromous fish will be hypothesized and used to evaluate the expected initial benefit of alternative forms of the NSA to anadromous fish.

The published literature and monitoring at other sites will also be used to hypothesize specific floodplain inundation conditions that are detrimental to anadromous fish and used to evaluate the expected risks to anadromous fish associated with the **NSA.** Stranding of anadromous fish has been monitored at the Cosumnes River Preserve and the Yolo Bypass to date (Keith Whitener, TNC and Ted Sommer, DWR, *personal communication);* slopes and flow recession rates that mimic conditions at these locations where stranding of native fish has not been a problem are presumed to represent conditions that will minimize stranding problems at the **NSA.** Predator fish species have been found to reside in permanently ponded areas at the Cosumnes River Preserve (Keith Whitener, TNC, *personal communication),* and creation of such floodplain-connected areas will be presumed to indicate an increased risk of predation to native species, including chinook salmon and steelhead juveniles feeding on the floodplain.

Other information may be available to enlarge upon this conceptual model of benefits and hazards to anadromous fish from floodplain inundation by the time the proposed work begins.

c. Hypotheses Being Tested

The proposed phase of work on this project will provide a test case of using hydrodynamic modeling to predict hypothesized beneficial and detrimental conditions, refine the proposed project design, and then permit the testing of the accuracy of the modeled conditions and predicted uses of the inundated floodplain after implementation. Currently, most such projects are developed using simple steady-state (single flood event) backwater models without branched flow to simulate with-project conditions. Such models provide only an estimate of flood

elevations under particular peak flow conditions and provide no detail about how flows move through a breached-levee, river-floodplain system.during the course of a spring flood season. If effective for predicting and refining proposed river-floodplain conditions, this approach could be extremely helpful to designing future such efforts, particularly at larger scales where an entirely empirical approach is inefficient. Specific discussion of the relationship of the proposed project as a whole to strategic goals and scientific uncertainties are discussed below.

ERP Strategic Goals:

- At-Risk Species
  The goal of the proposed project is to benefit at-risk native anadromous fish species of the San Joaquin River, including fall-run chinook salmon and steelhead trout, by providing seasonally-inundated floodplain for increased habitat area, food supply, and nutrient influx to the aquatic system (see for example Junk et al. 1989, Schlosser 1991).
- Ecosystem Processes **and** Biotic Communities
  The proposed project will provide river-floodplain connectivity in a selected reach of the San Joaquin River in support of a fundamental ecosystem process, seasonal floodplain inundation (see for example Junk et al. 1989, Schlosser 1991, Ward and Stanford 1995a, Ward and Stanford 1995b, Stanford et al. 1996).
- Restore Functional Habitat Types
  Seasonally-flooded floodplain has been identified as a key habitat for certain species, including anadromous fish; a fundamental component in foodweb productivity in aquatic systems; and a system that assists in water quality improvement through natural filtering processes (see for example Junk et al. 1989, Pinay et al. 1990, Schlosser 1991, Ward and Stanford 1995a, Ward and Stanford 1995b, Stanford et al. 1996). The productivity and metastability of floodplain areas is dependent on the temporal and spatial instability provided by the disturbance of periodic floods (Pinay et al. 1990, Ward and Stanford 1995b); restoration of this instability is key to river restoration (Stanford et al. 1996, Ebersole et al. 1997) and will be a fundamental aspect of the proposed NSA.

Scientific Uncertainties:

- Natural **flow** regimes
  The proposed project will include simulation modeling to predict inundated floodplain conditions, and the resulting habitat conditions, associated with alternative implementations of the NSA in combination with the anticipated flow regime on the San Joaquin River. Based on current knowledge of anadromous fish requirements for seasonal floodplain habitat, the proposed project may also include the identification of a modified flow regime that would better serve this habitat function in combination with the NSA.
- Restoration of ecosystem function in an altered river-floodplain system
  The proposed project will reconnect the San Joaquin River to a part of its floodplain that is already being managed for habitat value. The frequency, depth, area, and duration of inundation under the current (presumed) flow regime is not yet known, but will be addressed by the work proposed under this Phase of effort. There is potential to restore lands throughout the study reach below approximately the 40-foot elevation line on the west side of the river. Adjoining lands (upstream, downstream, on the east side of the river) are managed for agriculture, but at some point in the future may become available in whole or part for restoration purposes depending on the cost of levee upkeep, value of agricultural production,

local topography and facility constraints, landowner interest, changing flow regime on the San Joaquin, and success of the proposed **NSA** approach as a restoration and/or flood management measure.

- **Flood management as an ecosystem tool**
  The proposed project will examine opportunities for restoring river-floodplain connectivity without compromising adjoining land uses. It will help to identify an area along the San Joaquin where positive channel and riparian restoration responses could occur during the present operational regime or during enhanced managed floods. The current configuration of the roject has already been evaluated by the COE for its contribution to flood hazard management.
- **Shallow water'habitat**
  The proposed project will provide shallow water (floodplain) habitat and be designed to enhance seasonally flooded habitat and minimize its use by non-native and predator species.

d. Adaptive Management

The San Joaquin River NWR floodplain restoration project site offers excellent potential for creation of more than 3,000 acres of seasonally flooded habitat as the area is dedicated to habitat purposes and adjoins a large river system for which a Restoration Plan, including a revised flow regime, is presently being formulated by the Friant Water Users Authority and the Natural Resources Defense Council Coalition. The proposed project will be formulated so as to enable new information – whether in the form of a new understanding of the function of the physical system, a modified flow regime, or new understanding of the conditions most favorable to anadromous fish habitat use – to be used to revise the expected project benefits to anadromous fish and to design and test modifications of the system prior to implementation.

e. Educational Objectives

The project will demonstrate the feasibility of designing flood management actions that benefit anadromous fish. Post-implementation monitoring will be used to add to the body of evidence regarding the floodplain conditions favored by anadromous fish, other native species, and non-natives. It will also be used to evaluate the feasibility of predicting post-project hydrodynamic conditions and the effect of different flooding conditions on different species. The proposed work included in this proposal will specifically help to evaluate the usefulness of hydrodynamic modeling to the design of breached-levee floodplain restoration projects.

2. Proposed Scope of Work

a. Location and/or Geographic Boundaries of **the Project**

This project is situated in ecozone 12, (centroid at approximately latitude 37°36'01" and longitude 121°12'00"), located on the San Joaquin River between the confluence of the two largest salmon producing tributaries in the San Joaquin -- the Tuolumne and the Stanislaus rivers, and is approximately 9 miles west of the city of Modesto. See Figures 1 and 2. The levee breech sites identified in the NSA plan prepared by the US Army *Corps* of Engineers (COE) are located on the San Joaquin River from approximately river mile (RM) 79 to RM 86.

b. Approach

Work by this joint venture partnership (status: awaiting contract) will be funded for FY 2000 by the Anadromous Fish Restoration Program (AFRP) to accomplish the following: 1) examine potential floodplain and hydrology interactions and outcomes of the proposed NSA specifically focused on the needs of anadromous fish, 2) attempt to identify potential benefits or risks to anadromous fish, and *3)* identify potential **NSA** refinements to ensure that benefits to anadromous and native resident fish species are realized. This proposal will build on the technical studies and NSA alternative development and analysis that will have been completed by the time of its commencement. This includes the COE NSA analysis, and floodplain contour information generated by the COE Sacramento/San Joaquin Comprehensive Study process, and the AFRP FY2000 study cited above.

We will draw on the expertise and guidance of three distinct groups in conducting the proposed work agency staff, the public/stakeholders, and scientific experts. We will involve the agencies participating in the project (USFWS: Refuge and *AFRP,* DFG, COE) as **a** technical review panel both to provide coordination with other activities and to guide the focus and content of this work with respect to NSA goals. We will also interface directly with the Refuge's public outreach program to solicit public and stakeholder input on the formulation of alternatives and assessment of results. Lastly, we will also assemble an expert review panel (e.g., Peter Moyle of UCD, Keith Whitener of TNC-Cosumnes, Ted Sommer of DWR-Yolo Bypass) to also guide us in the formulation of alternatives, assessment of results, and development of a post-implementation monitoring plan. This interactive effort will ensure that the work conducted is as useful as possible to the Refuge in achieving successful ecosystem enhancement through implementation of the NSA. Additional quality assurance of the hydrodynamic modeling will occur through the review of model simulations by **an** outside expert (e.g., Dr. Peter Goodwin, P.E., of the University of Idaho, Morten Rung0 of DHI).

The analysis tool that we will use to conduct our effort is the one-dimensional looped-network hydrodynamic model called MIKE 11. Its strength for hydrodynamic analysis are its ability to incorporate and display information within a GIS, its stability, and its capability to also simulate other key river characteristics, such as sediment transport and water quality conditions associated with a system's hydrodynamics. This model was developed by the Danish Hydraulics Institute (now renamed DHI) and has decades of proven use, primarily through European institutions, in all parts of the world on projects of all sizes. It has just been approved (April, 2000) by FEMA for use in floodplain mapping, and is being actively used by a number of US Army Corps of Engineers Districts for analysis.

The kind of data used by the hydrodynamic module of MIKE 11 is essentially the same as is required for UNET, a similar hydrodynamic model that does not currently have the support, ease of use, or graphical interface associated with MIKE 11. Nonetheless, the type of data they employ is the same: schematicized one-dimensional representations of a flow system using topographic data to describe the cross-sections, with defined boundary conditions, including one or more inflow hydrographs. Cross-sectional data from the Sacramento-San Joaquin Comprehensive UNET flood study is available to describe the physical conditions in the San Joaquin river channel. This data can be used in the MIKE 11 model of the system that we will use to evaluate the NSA.

c. Monitoring and Assessment Plans

As part of the proposed work, we will develop an hydraulic monitoring plan to test the post-implementation conditions at the site, allow calibration of the hydrodynamic model for adaptive management application in the future, and evaluate the effectiveness of pre-project simulation modeling. This monitoring planning will be fully coordinated with the monitoring plan development for the NSA being proposed by the Refuge as part of their proposal to CALFED under the current Year 2000 PSP which will address habitat conditions and use of the site by fish.

d. Data Handling and Storage

Data used in model development and results evaluation will be collected and organized by PWA. All sources will be documented in a technical appendix to the final project report. Hydrodynamic model input files will be available from PWA on request. Model output files will be available in electronic form and will be converted to graphical animations for presentations and alternatives assessment. The results of one alternative simulation, selected in coordination with the technical review panel, will be converted to GIS format and provided with metadata to the Refuge or another appropriate entity identified by the Refuge.

e. Expected Products/Outcomes

This effort will produce a recommended refinement of the proposed NSA configuration for the SJRNWR. It will be based in significant part on hydrodynamic model simulations of up to five alternative configurations of the NSA. An evaluation of these alternative NSA configurations will be performed and reported, including a recommended alternative or alternatives that will meet the ecosystem enhancement and flood hazard reduction goals. A monitoring plan for post-implementation assessment of hydraulic conditions will be developed and presented. The methodology, criteria for evaluation, and results will be presented in a final report. This information will be incorporated into the final design of the NSA implementation that is being proposed under a separate CALFED submittal under this PSP.

Presentations/Workshops

Alternatives formulation workshop (public, technical review, expert)
Interim Results presentations (public, technical review, expert)
Final Results presentations (public, technical review, CALFED)

Reports/Deliverables

Draft Project Report (including hydraulic monitoring plan)
Final Project Report (including hydraulic monitoring plan, hard copy and www copy, results animations)
GIS data files for Recommended Alternative (electronic)
Simulation Results Files (electronic)

f. Work Schedule

The project schedule is displayed in Table 1 on the following page. The development of the hydrodynamic monitoring plan is a separable task, but all other tasks are linked and must be funded in a single phase, though some task modifications are negotiable if desired. Major milestones include:

Interim Results presentations Month 8

Draft Final Report	Month 10
Final Report	Month 12

g. Feasibility

The proposed effort's feasibility is ensured by the following:

1. ***The applicant's experience in completing similar projects.*** By the time this proposal is being considered for contracting (Fall 2000), the applicants will also be able to show the results of the similar initial work being conducted under a AFRP FY 2000 contract.
2. ***The involvement of agencies, the public, and experts.*** All interested and affected parties will have an opportunity to participate in this process. The applicants are, in particular, coordinating closely with the SJRNWR staff on this proposal and have their full support.
3. ***The commitment and availability of the applicant.*** DU and PWA have committed staff to carry out this work in 2001 and, due to the need for this work for effective NSA implementation and the great importance we place on this ground-breaking enhancement-focused work, will give it the highest priority.
4. ***The Refuge will conduct all needed NSA final design and implementation, including environmental compliance, following completion of the work proposed herein.***

D. APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN AND CVPIA PRIORITIES

1. ERP Goals and CVPIA Priorities

The related proposal being submitted by the Refuge for NSA implementation (*SJRNWR* Riparian Habitat Protection and Floodplain Restoration Project, Phase 2) may be referenced for a detailed description of the benefits expected from the NSA as a whole, summarized below.

This project will serve three of the six ERP goals:

- At-Risk Species
- Ecosystem Processes and Biotic Communities
- Habitats

In addition, 21 out of the 22 CVPIA "Considerations for Ranking Specific Actions" are positive for this project and the NSA it supports (all but positive economic impacts). This particular proposal qualifies as a necessary precursor to an implementation action.

In particular, the NSA addresses the all four of the foci identified in "The Approach and Focus for Implementing the Central Valley Project Improvement Act: 1999-2004":

- Anadromous Fish Species (especially San Joaquin fall-run chinook; will address quality and accessibility of riparian habitat, two of the four highly significant limiting factors for anadromous fish in the San Joaquin Basin)
- Central Valley Refuges and Other Waterfowl Habitats
- Other Fish, Wildlife, and Associated Habitats
- Additional CVPIA Provisional Benefits

Specifically, this project will allow the reconnection of the mainstem San Joaquin River with floodplain lands at the Refuge near the confluence of the Tuolumne River through levee modification. Inundation of the lands will occur in response to high flows on the San Joaquin, probably through levee breaches along the river. Re-initiation of this natural disturbance pattern will rejuvenate and expand floodplain habitats (seasonal wetlands, riparian vegetation) and beneficial biogeochemical interactions between the river and floodplain that are driven by seasonal flooding (Pinay et al. 1990, Ward and Stanford 1995b, Stanford et al. 1996). It will allow greater reworking of the river channel in this reach, potentially including lateral migration, than has been possible with the intact levee system in place.

This project will improve rearing conditions for at-risk and ESA-listed juvenile salmonids (fall-run chinook salmon and steelhead) as well as spawning and rearing conditions for other native fish species, minimize the potential for stranding of native fish species given increased river access to the floodplain, enhance ecological functionality and habitat quality of the aquatic-terrestrial zone in this reach of the San Joaquin River, and enhance overall San Joaquin River foodweb productivity.

Relationship to Other Ecosystem Restoration Projects

This proposed effort builds on two proposals previously funded by CALFED, shown by submittal year:

1997	San Joaquin River National Wildlife Refuge Riparian Habitat Protection and Floodplain Restoration Project
1998	Lower San Joaquin River Floodplain Protection and Restoration Project (Stanislaus and Merced Counties)

It will also build on a proposal awaiting contract by AFRP for completion this year: Evaluation of the Proposed Non-structural Flood Control Alternative on the San Joaquin National Wildlife Refuge

In addition, it will directly support and feed into the following proposal also currently being submitted to CALFED by providing valuable information for preparation of the final project design: San Joaquin River National Wildlife Refuge Riparian Habitat Protection and Floodplain Restoration Project: Phase II

2. Requests **for** Next-Phase Funding

As specified in Subsection 2 above, this proposal is related to currently funded projects and will augment a next-phase funding proposal currently being submitted by the SJRNWR under separate cover.

3. Previous Recipients **of CALFED** or **CVPIA** Funding

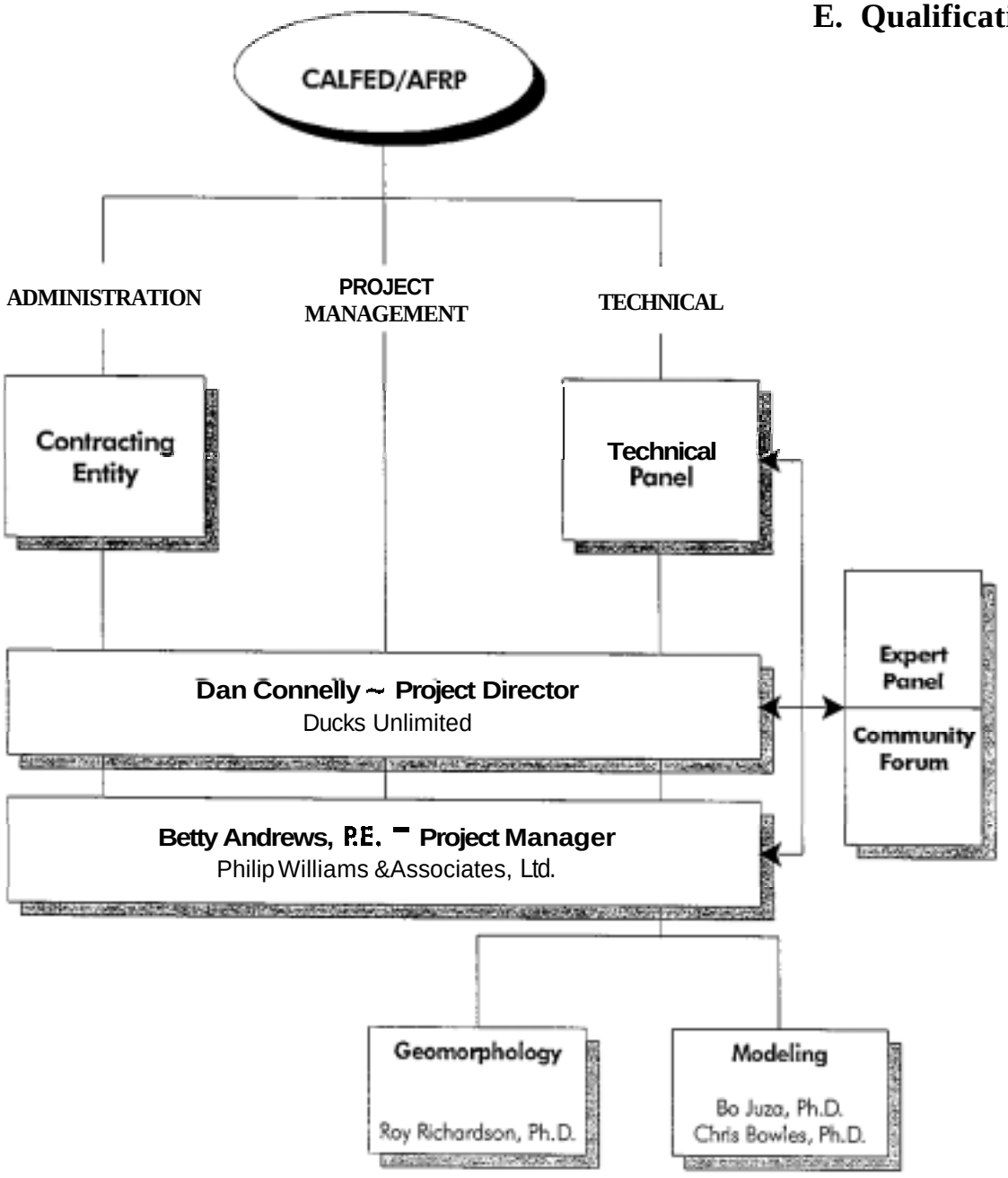
See attachment "A"

4. System-Wide Ecosystem Benefits

Elsewhere within the basin, the Friant Water Users Authority and the NRDC coalition are in the process of developing a San Joaquin River Restoration Plan. While the focus area of the project extends only to the confluence of the Merced River, the Plan is intended to provide ecosystem enhancement of the river all the way to the Delta, and therefore includes this reach of the San Joaquin. Part of the Restoration Plan is expected to include changes in the flow regime on the river, and could directly benefit this site by ultimately increasing the area, frequency, and/or duration of inundated floodplain lands during ecologically useful periods at this location.

In addition, this project will synergistically interact with many other ecosystem enhancement activities within the basin, including efforts on upstream tributaries and the river and estuary downstream, by providing increased seasonal wetland habitat, improved riparian and aquatic habitat, improved supply of nutrients, and improved overall foodweb productivity. It will constitute a fundamental restoration building block for the San Joaquin: "Indeed, a primary strategy of large river restoration should be to identify, stabilize, restore and reconnect river segments to core areas containing native food-webs.'' (Stanford et al. 1996, p. 406).

E. Qualifications



Name*	Role/Responsibility	Availability	Conflict of Interest	Comment
Dan Connelly	Project Director	as needed for project	None	Ducks Unlimited Employee
Betty Andrew, P.E.	Project Manager/ Engineer	as needed for project	None	PWA Employee
Roy Richardson, Ph.D.	Geomorphologist	as needed for project	None	PWA Employee
Bo Juza, Ph.D.	Modeling Manager	as needed for project	None	PWA Employee
Chris Bowles, Ph.D.	Modeler	as needed for project	None	PWA Employee

* Detailed qualifications and contributions listed in Attachments

See Attachment B.

F. COST

1. Budget

See Table 2 on the following page.

Task List and description

Task 1. Project Initiation

1.1 Revise baseline hydrodynamic model

The hydrodynamic model of the NSA that is being developed with AFRP funding in the year 2000 will be updated to incorporate additional information that may have become available since project completion or that has since been identified as useful refinement or appropriate revised assumptions to include.

1.2 Organize technical and expert panels

The applicant will organize two panels for input and review of this work effort. The Technical Panel will be composed of agency staff with a role in implementing the NSA (e.g., Refuge, DFG, AFRP, NMFS) and technical staff from the applicant and its consultant, including the hydrodynamic modeler and geomorphologist for this project. The Expert Panel will be composed of individuals with expertise in floodplain restoration benefits to anadromous fish (e.g., Peter Moyle, Keith Whitener, Ted Sommer).

Task 2. Formulate, Simulate. Evaluate Alternatives

2.1 Solicit input on alternatives, evaluation criteria: Community Forum, expert panel

The applicant will hold two sessions to solicit input on the NSA alternative configurations and benefit/impact evaluation criteria. This effort will build on the NSA evaluation effort that is being developed with AFRP funding in the year 2000.

2.2 Formulate alternatives and disseminate

Based on the input from Task 3 and in coordination with the Technical Panel, the applicant will formulate up to three alternative NSA configurations for evaluation and the benefit/impact evaluation criteria by which to evaluate them.

2.3 Assemble models of alternatives

The hydrodynamic base model will be revised to represent up to three alternative NSA configurations.

2.4 Perform hydrodynamic simulations

The hydrodynamic base model will be run to produce results representative of up to three alternative NSA configurations.

2.5 Analyze hydrodynamic simulation results

The results from Task 6 will be analyzed relative to the benefit/impact evaluation criteria developed in Task 4.

2.6 Draft hydraulic monitoring plan

In coordination with the technical panel, the applicant will develop a proposed draft monitoring plan to evaluate the hydraulic performance of the NSA after implementation.

Task 3. Develop Final Recommendations

3.1 Present interim results: Community Forum, expert panel, technical panel

The applicant will hold three sessions to solicit input on the results of Tasks 7 and 8 and on an additional NSA configuration alternative that may be suggested by

this review of Task 7 results. A final decision on the configuration of the additional alternative will be made in coordination with the Technical Panel.

3.2 Formulate, simulate, evaluate additional alternative

The applicant will revise the base model for the additional alternative, perform the simulation, and evaluate the results.

3.3 Identify recommended alternative(s)

In coordination with the Technical Panel, the applicant will identify the recommended NSA configuration alternative(s).

3.4 Develop revised flow regime recommendation

In coordination with the Technical Panel, the applicant will evaluate the potential for improved floodplain inundation characteristics for anadromous fish that could occur under a revised flow regime and identify the characteristics of this desirable flow regime. This information may prove useful to concurrent efforts by others to develop a San Joaquin Restoration Plan, potentially including a revised flow regime.

3.5 Prepare final hydraulic monitoring plan

Based on input from Task 9, the applicant will prepare the hydraulic monitoring plan that can be implemented after the NSA is in place.

3.6 Prepare Draft Final Report

The applicant will prepare a Draft Final Report that describes project methodology, assumptions, benefit/impact evaluation criteria, alternatives. results, alternative evaluation, and a recommended alternative. The report will also include the hydraulic monitoring plan and an assessment of the potential for a revised flow regime to improve floodplain conditions for anadromous fish. No evaluation of the probability of the revised flow regime will be included, and potential on-site impacts of such a regime will be only qualitatively discussed.

3.7 Distribute Draft Final Report

The applicant will produce 25 copies of a draft final report and distribute them to the expert panel, technical panel, the funding entity, and selected members of the Community Forum and one or more sites which can make them available to other members of the Community Forum.

3.8 Draft Report review: Community Forum, expert panel, technical panel

The applicant will accept written comments from all draft report reviewers.

Task 4. Develop and Disseminate Final Results

4.1 Prepare Final Report

Based on comments on the draft, the applicant will prepare the Final Report.

4.2 Submit Final Report and Publish on WWW

The applicant will produce 50 copies of a final report and distribute them to the expert panel, technical panel, the funding entity, and selected members of the Community Forum and one or more sites which can make them available to other members of the Community Forum and the public. In addition, the applicant will publish an electronic version of the report on the world wide web at an appropriate site, such as the AFRP website.

4.3 Presentations: Community Forum and technical panel, CALFED/AFRP

The applicant will conduct two presentations of the Final Report of up to two-hours at appropriate locations in the Central Valley.

Task 5. Project Management

5.1 Quarterly Reports

The applicant will prepare and submit quarterly reports on the project progress and status based in part on input provided by PWA.

5.2 Coordination

The applicant and its consultant, PWA, will coordinate throughout the project with the members of the Technical Panel, the Expert Panel, the Community Forum, and the funding entity to ensure a successful project outcome.

Travel will include site reconnaissance and attendance at Technical Panel, Community Forum, and Expert Panel meetings in Modesto and/or Sacramento. Supplies will include reproduction costs, including 75 bound reports, estimated at $50 each, preparation of large graphic plots for presentations, a fee of 12.50/hour for dedicated computer time, and minor quantities of items such as film, film processing, and office supplies.

Over head rate: The indirect overhead rate has been approved by the Department of Agriculture with no modifications. The rate, 13.55% may be applied to all costs on the projects (including salary, materials, subcontract charges, etc.). The rate includes information service expenses, office services expenses, meeting and conference expense, government relations expenses and program G&A expenses. Full details of all allowable charges are on file at the Western Regional Office of Ducks Unlimited, Inc.

Service contracts with PWA and four other consultants have been assumed. PWA will acquire special expertise in the San Joaquin River NWR under the AFRP contract that will be completed in 2000, as earlier described. PWA also have excellent experience in the development of integrated flood management and habitat restoration plans and the use of hydrodynamic models to inform that planning process. A total of $167,320 is included in the budget as a service contract to PWA, of which $10,825 are allocated to expenses, including report production. Other as-yet unspecified consultants will be included in the proposed scope of work to provide expert review of the project and quality assurance review of the simulation tasks. Five thousand dollars per consultant for a total of $20,000 has been included as service contracts for this purpose. Approximately $4,000 is expected go towards fee for service ($1,000 per day, four days of time) and $1,000 for related travel, messenger, reproduction, etc.

No equipment purchase is planned.

2. Cost-Sharing

Prior funding commitments to the NSA project include $11.75 million from CALFED for the 1997 and 1998 Phase I efforts, primarily for land acquisition; $57,465 from AFRP (awaiting contract) for a year 2000 effort to analyze the expected effects of the NSA's proposed configuration on anadromous fish, and unknown additional contributions of in-kind services from USFWS, DFG, and Refuge staff in developing the NSA as a restoration enhancement project. Additional funds for Phase II of the effort are also being sought by the Refuge from CALFED/AFRP under this PSP funding cycle. This proposal, however, is not contingent on funding for that related project.

Table 2. Project Budget

Year	Task	Subject to Overhead: Direct Labor Hours	Salary Including FICA	Benefits @ 20% of Salary	Travel	Staff suppor & Supplies	Service Contracts	Overhead (13%)	Exempt from Overhead: Equipment	Graduate Student Fe Remissior	Total Cost
Year 1.	/Task 1						$12,445	$1,681			$14,131
	Subtask 1.1						$6,375	$86			$7,239
	Subtask 1.2						$6,070	$82:			$6,892
	Task 2						$78,370	$10,61			$88,989
	Subtask 2.1						$18,670	$2,53(			$21,200
	Subtask 2.2						$7,670	$1,03			$8,709
	Subtask 2.3						$13,640	$1,84			$15,488
	Subtask 2.4						$24,700	$3,34			$28,047
	Subtask 2.5						$7,690	$1,042			$8,732
	Subtask 2.6						$6,000	$81			$6,813
	Task 3						$61,470	$8,325			$69,799
	Subtask 3.1						$26,330	$3,56			$29,898
	Subtask 3.2						$5,620	$76			$6,382
	Subtask 3.3						$2,590	$351			$2,941
	Subtask 3.4						$5,32	$721			$6,041

Table 2. Project Budget

Subtask 3.5						$4,200	$569			$4,769
Subtask 3.6						$16,170	$2,191			$18,361
Subtask 3.7						$1,240	$168			$1,408
Subtask 3.8						$0	$0			$0
Task 4						**$21,875**	**$2,964**			$24,839
Subtask4.1						$10,040	$1,360			$11,400
Subtask 4.2						$1,955	$265			$2,220
Subtask 4.3						$9,880	$1,339			$11,219
Project :Management	384	$10,560	$2,112	$1,200	$3,072	**$13,160**	$4,079			$34,183
otal **Cost Year** 1		$10,560	$2,112	$1,200	$3,072	**$187,320**	**$27,678**	$0	$	$231,942
otal Project *Cost*		$10,560	$2,112	$1,200	$3,072	**$187,320**	**$27,678**	$0	$	$231,942

G. LOCAL INVOLVEMENT

Public outreach for this project will be conducted in concert with the "Community Forum" public outreach process already instituted by the Refuge. Under the Community **Forum,** the Refuge holds quarterly public/stakeholder meetings to solicit input and present information on the operation of the Refuge to local landowners and the interested public. Under this proposal, three presentations to the Community **Forum** are anticipated:

- Solicitation of input on NSA Alternatives formulation
- Presentation of interim results for review and comment; solicitation of input on formulation of an additional NSA Alternative
- Presentation of final report and results

The proposed effort for refinement of the NSA will help the Refuge to address some of the potential third party concerns by providing additional information on expected hydrologic and hydraulic effects of the NSA project as well as evaluation of potential NSA configuration alternatives.

Detailed discussion of the project third parties, including level of support and opposition for the NSA overall, is more appropriately addressed in the Refuge's current proposal submittal for implementation of the NSA. There are no third party positions specific to the scope of work proposed here, but only to the NSA as a whole.

United States Department of the Interior

FISH **AND** WILDLIFE SERVICE
San **Luis** National Wildlife Refuge Complex
P.O. Box 2176
Los Banos, CA 93635
(209) 826-3508 - Fax (209) 826-1445

Mr. Dan Connelly
Ducks Unlimited
3074 Gold Canal Drive
Rancho Cordova, Calif. 95670-6116

May 9,2000

Dear Dan:

This letter is written to confirm that your Cal Fed project proposal "Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement" enjoys both the full support and endorsement of the Refuge and that you will be provided access for the purpose of conducting project activities. As you are aware the San Luis NWR Complex is also submitting a habitat restoration project proposal that compliments the aquatic resource benefits assessment represented in your proposal.

If I can be of any further assistance, please call on me at any time

Sincerely,

Kim Forrest
Refuge Manager

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916) 852-2000
(916) 852-2200 Fax

DUCKS UNLIMITED INC.

May 11,2000

Stanislaus County
Clerk of the Board of Supervisors
1010 10th Street
Modesto, CA 95354

Madam Clerk:

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the clerk of the Board of Supervisors of the county in which our project is located and supply a copy of the proposal.

We are pleased to submit a copy of our proposal titled: "Non-Structural Alternative at the San Joaquin National Wildlife Refuge: Refinement for Habitat Enhancement". The total project consists of engineering and hydraulic analysis, design refinement, implementation, and monitoring for a channel-floodplain reconstruction project. The effort addressed in this proposal includes hydrodynamic analysis and refinement of the current NSA proposal with respect to the needs of anadromous fish. Specific concerns include the depth, duration, timing, and frequency of floodplain inundation as well as limiting the potential for both stranding and enhancement of conditions supporting predatory fish species.

This project will improve wetland habitats as well as rearing conditions for juvenile fall run salmon and steelhead. If approved, work on the project will commence during the summer and fall of 2001.

If you have any questions or concerns regarding the CALFED process or the proposed construction project, please feel free to call.

Sincerely,

Dan Connelly
Program Coordinator, Valley/Bay CARE

DUCKS UNLIMITED, INC.
WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, California 95670-6116
(916) 852-2000
(916) 852-2200 Fax

DUCKS UNLIMITED INC.

May 11,2000

Stanislaus County
Director, Planning and Community Development Department
1010th 10th Street
Modesto, CA **95354**

Dear Sir,

Ducks Unlimited is participating in this year's CALFED Proposal Solicitation Program for Ecosystem Restoration Projects and Programs. As stated in the Solicitation Package, we are required to notify the clerk of the Board of Supervisors of the county in which our project is located and supply a copy of the proposal.

We are pleased to submit a copy of our proposal titled: "Non-Structural Alternative at the San Joaquin National Wildlife Refuge: Refinement for Habitat Enhancement". The total project consists of engineering and hydraulic analysis, design refinement, implementation, and monitoring for a channel-floodplain reconstruction project. The effort addressed in this proposal includes hydrodynamic analysis and refinement of the current NSA proposal with respect to the needs of anadromous fish. Specific concerns include the depth, duration, timing, and frequency of floodplain inundation as well as limiting the potential for both stranding and enhancement of conditions supporting predatory fish species.

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If you have any questions or concerns regarding the CALFED process or the proposed construction project, please feel free to call.

Sincerely,

Dan Connelly
Program Coordinator, Valley/Bay CARE

Environmental Compliance Checklist

Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement

All applicants must fill out *this* Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. ***Failure to answer these Questions and include them with the application will result in the application being considered nonresponsive and not considered for funding:***

1. Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?

   X — YES ____ NO

2. If you answered yes to #1, identify the lead governmental agency for CEQA/NEPA compliance.

   U.S. Fish and Wildlife Service
   Lead Federal Agency

3. If you answered no to #1, explain why CEQA/NEPA compliance is not required for the actions in the proposal.

   N/A

4. If CEQA/NEPA compliance is required, describe how the project will comply with either or both of these laws. Describe where the project is in the compliance process and the expected date of completion.

   Existing EA's cover most project components. **A** new EA will be prepared to address breeching levees.

5. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

   ____ YES X NO

   If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with **30** days of notification of approval.

6. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

LOCAL

Conditional use permit	___	
Variance	___	
Subdivision Map Act approval	___	
Grading permit	___	
General plan amiendment	___	
Specific plan approval	___	
Rezone	___	
Williamson Act Contract cancellation	___	
Other_____ (Please Specify)		
None required	X	

STATE

CESA Compliance	___	(CDFG)
Streambed alteration permit	___	(CDFG)
CWA § 401 certification	___	(RWQ CB)
Coastal development permit	___	(Coastal Commission/BCDC)
Reclamation Board approval		
Notification	___	(DPC, BCDC)
Other _____ (please specify)		
None required	X	

FEDERAL

ESA Consultation	___	(USFWS)
Rivers & Harbors Act permit	___	(ACOE)
CWA § 404 permit	___	(ACOE)
Other: NMFS – National Marine Fisheries Service Consultation (please specify)	___	
None required	X	

DPC = Delta Protection Commission
CWA = Clean Water Act
CESA = California Endangered Species Act
USFWS = U.S. Fish and Wildlife Service
ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish and Game
RWQCB = Regional Water Quality Control Board
BCDC = Bay Conservation and Development Comm.

Land Use Checklist

Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. **Do** the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?

   X YES ____ NO

2. If **NO** to #1, explain what type of actions are involved in the proposal (i.e., research only, planning only).

   Reconstruction of fish screens and ladders and upgrading weirs

3. **If** YES to **#1,** what is the proposed land use change **or** restriction under the proposal?

   Fallow agricultural fields inundated by the 1997 flood event will be dedicated riparian habitat managed as a unit of the San Joaquin River NWR. Project flood control levees will bw breeched as recommended by US COE (Army *Corps* of Engineers)

4. If YES **to #1,** is the land currently under **a** Williamson Act contract? N/A

   ____ YES **X** NO

5. **If** YES to #1, answer the following:

   Current land use Fallow
   Current zoning Agriculture
   Current general plan designation Agriculture

6. If YES **to #1, is the** land classified **as** Prime Farmland, Farmland of Statewide Importance or Unique Farmland **on** the Department of Conservation Important Farmland Maps?

   ____ X

YES NO

7. If **YES** to #1, how many acres of land will be subject **to** physical change or land **use** restrictions under the proposal?

1600 acres

8. If **YES** to **#1,** is the property currently being commercially farmed or grazed?

YES X NO

9. If **YES** to **#8,** what are: the number of employees/acre N/A
the total number of employees N/A

10. Will the applicant acquire any interest in land under the proposal (fee title or a conservation easement)?

YES NO

11. What entity/organization will hold the interest? USFWS
12. If **YES** to #10, answer the following:

Total number of acres to be acquired under proposal N/A
Number of acres to be acquired in fee N/A
Number of acres to be subject to conservation easement 3185 acres

13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

Manage the property: USFWS
Provide operations and maintenance service: USFWS
Conduct monitoring: USFWS

14. **For** land acquisitions (fee title or easements), will existing water rights also be acquired?

X YES NO

15. **Does** the applicant propose any modifications to the water right or change in the delivery of the water?

YES X NO

16. If **YES** to #15, describe: N/A

STATE AND FEDERAL FORMS

Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement

STATE **FORMS:**

1. Nondiscrimination Compliance Statement – ATTACHED
   (for public, private and nonprofit applicants only)

2. Proof of Contractors License – ***(To*** be submitted when a Contractor is hired for this project)
   (for private and nonprofit applicants proposing construction projects)

3. Non-collusion Affidavit – ***(To*** be submitted when a Contractor is hired for this project)
   (for public, private and non-profit applicants proposing construction projects)

4. Bidders Bond - ***(To*** be submitted when a Contractor **is** hired for this project)
   (for private and non-profit applicants proposing construction projects)

5. Pavment Bond - (To be submitted when a Contractor is hired for this project)
   (for private and non-profit applicants proposing construction projects)

6. Performance Bond - (To be submitted when a Contractor is hired for this project)
   (for private and non-profit applicants proposing construction projects)

FEDERAL FORMS:

1. Standard 424 – ATTACHED
   (for all applicants except federal agencies)

2. Assurances - Non Construction Programs - ATTACHED

STATE OF CALIFORNIA

NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV. 3-95)

COMPANY NAME

The company named above (herinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division **4,** Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), medical condition (cancer), age (over 40), marital status, denial of family care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification. executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

Ronald A. Stromstad

DATE EXECUTED

2-15-00

EXECUTED IN THE COUNTY OF

Sacramento

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Director of Operations

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Ducks Unlimited, Inc.

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

2. DATE SUBMITTED	Applicant Identifier
5/15/00	N/A

1 TYPE OF SUBMISSION:		3. DATE RECEWED BY STATE	State Application Identifier
Application ☐ Construction ☒ Non-Construction	Preapplication ☐ Construction ☐ Non-Construction	4. DATE RECENED BY FEDERALAGENCY	Federal Identifier

5 APPLICANT INFORMATION

Legal Name:	Organizational Unit
Ducks Unlimited, Inc.	Western Regional Office
Address (give city, county, State. and zip code): 3074 Gold Canal Drive Rancho Cordova, CA 95670	Name and telephone number of person to be contacted on matters involving this application (give area code) Dan Connelly

6. EMPLOYER IDENTIFICATION NUMBER (EIN): 13-5643799

7. TYPE OF APPLICANT: (enter appropriate letter in box) N

A. State; B. County; C. Municipal; D. Township; E. Interstate; F. Intermunicipal; G. Special District; H. Independent School Dist.; I. State Controlled Institution of Higher Learning; J. Private University; K. Indian Tribe; L. Individual; M. Profit Organization; N. Other (Specify) Non-profit

8. TYPE OF APPLICATION

☒ New ☐ continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es) ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
O. Decrease Duration Other (specify):

9. NAME OF FEDERAL AGENCY:

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER ☐☐-☐☐☐

TITLE:

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:
Non-Structural Alternative at the San Joaquin River National Wildlife Refuge: Refinement for Habitat Enhancement

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):
Stanislaus County, California,

13. PROPOSED PROJECT		14. CONGRESSIONAL DISTRICTS OF	
Start Date	Ending Date	a. Applicant	b. Project
4/1/01	4/1/02	4th District	18th District

15. ESTIMATED FUNDING:

a. Federal	$	231,942 .00
b. Applicant	$	.00
c. State	$	.00
d. Local	$	.00
e. Other	$	.00
f. Program Income	$	.00
g. TOTAL	$	231,942 .00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON

DATE _____

b. No. ☐ PROGRAM IS NOT COVERED BY E.O. 12372
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
Ronald A. Stromstad	Director of Operations	(916)852-2000
d. Signature of Authorized Representative		e. Date Signed 5-22-00

Previous Edition Usable
Authorized for Local Reproduction

Standard Form 424 (Rev. 7-97)
Prescribed by OMB Circular A-102

BUDGL ... RMATION - Non-Construction Pro_rams

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. San Joaquin River NWL Hydrology Study		$	$	$ 231,942	$	$ 231,942
2.						
3.						
4.						
5. Totals		$	$	$ 231,942	$	$ 231,942

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1)	(2)	(3)	(4)	Total (5)
a. Personnel	$ 10,560	$	$	$	$ 10,560
b. Fringe Benefits	2,112				2,112
c. Travel	1,200				1,200
d. Equipment	-0-				-0-
e. Supplies	3,072				3,072
f. Contractual	187,320				187,320
g. Construction	-0-				-0-
h. Other	-0-				-0-
i. Total Direct Charges (sum of 6a-6h)	204,264				204,264
j. Indirect Charges	27,678				27,678
k. TOTALS (sum of 6i and 6j)	$ 231,942	$	$	$	$ 231,942
7. Program Income	$	$	$	$	$

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Standard Form 424A (Rev. 7-97)
Prescribed by OMB Circular A-102

Previous Edition Usable

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. N/A	$	$	$	$
9.				
10.				
11.				
12. TOTAL *(sum of lines 8-11)*	$	$	$	$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 231,942	$ 57,985.50	$ 57,985.50	$ 57,985.50	$ 57,985.50
14. Non-Federal					
15. TOTAL *(sum of lines 13 and 14)*	$ 231,942	$ 57,985.50	$ 57,985.50	$ 57,985.50	$ 57,985.50

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.	$	$	$	$
17.				
18.				
19.				
20. TOTAL *(sum of lines 16-19)*	$	$	$	$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: $204,264

22. Indirect Charges: $27,678

23. Remarks:

OMB Approval No. 0348-0040

ASSURANCES - NON-CONSTRUCTION PROGRAMS

'LEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

s the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the Institutional. managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. 5547284763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin: (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683. and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 5794). which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug .Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (9 the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records: (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Properly Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which iimit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable. with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. 5874). and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply. if applicable. with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514: (b) notification of violating facilities pursuant to EO 11738: (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. $470). EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research. teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Ronald A. Stromstad	Director of Operations
APPLICANT ORGANIZATION	DATE SUBMITTED
Ducks Unlimited, Inc.	5/15/00

I. LITERATURE CITED

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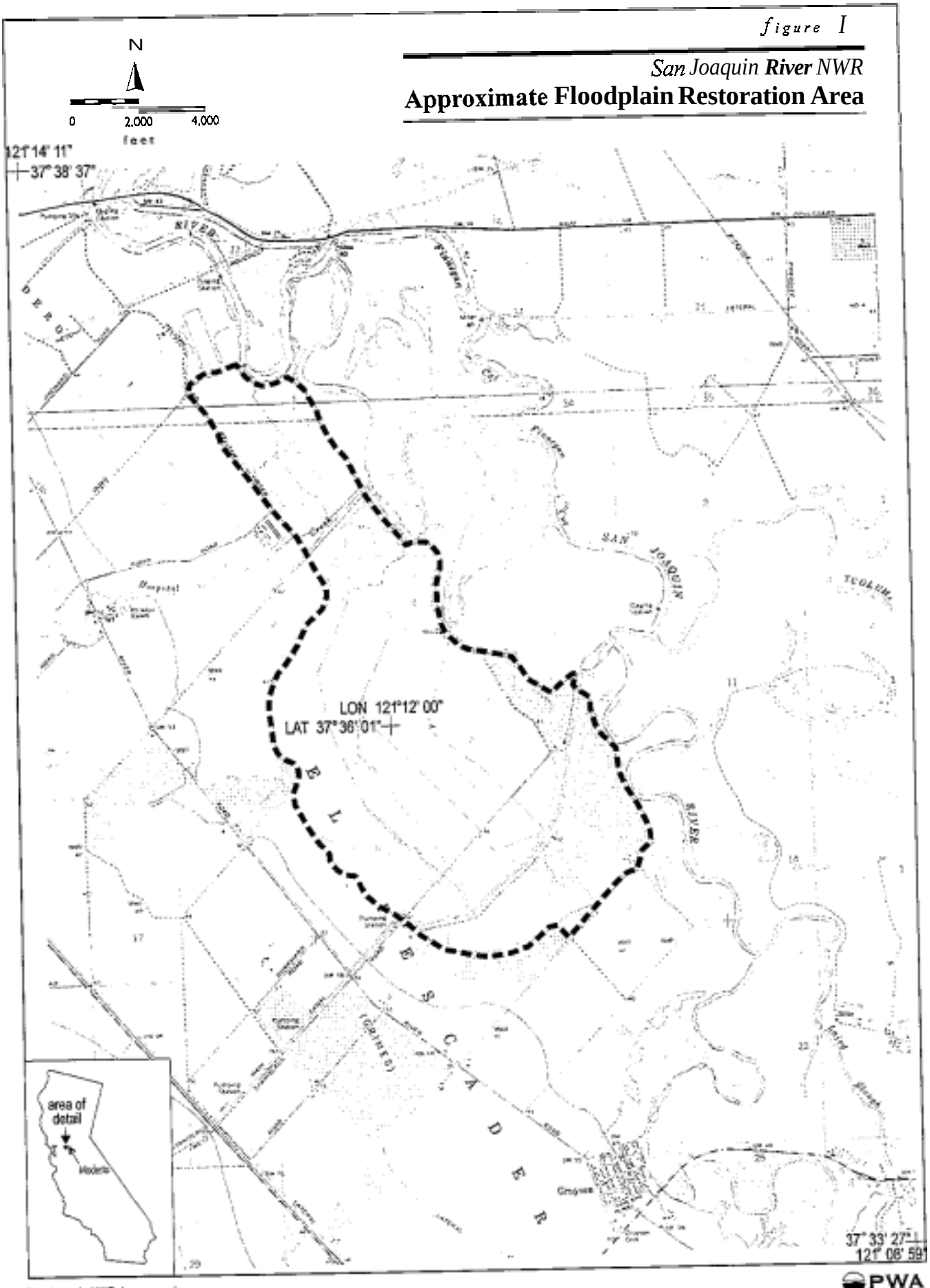
Ward, J. V. and Stanford, J. A. 1995b. Ecological connectivity in alluvial river ecosystems and its disruption by flow regulation. *Regulated Rivers: Research & Management,* 11:105-119.

figure I

San Joaquin ***River*** *NWR*

Approximate Floodplain Restoration Area



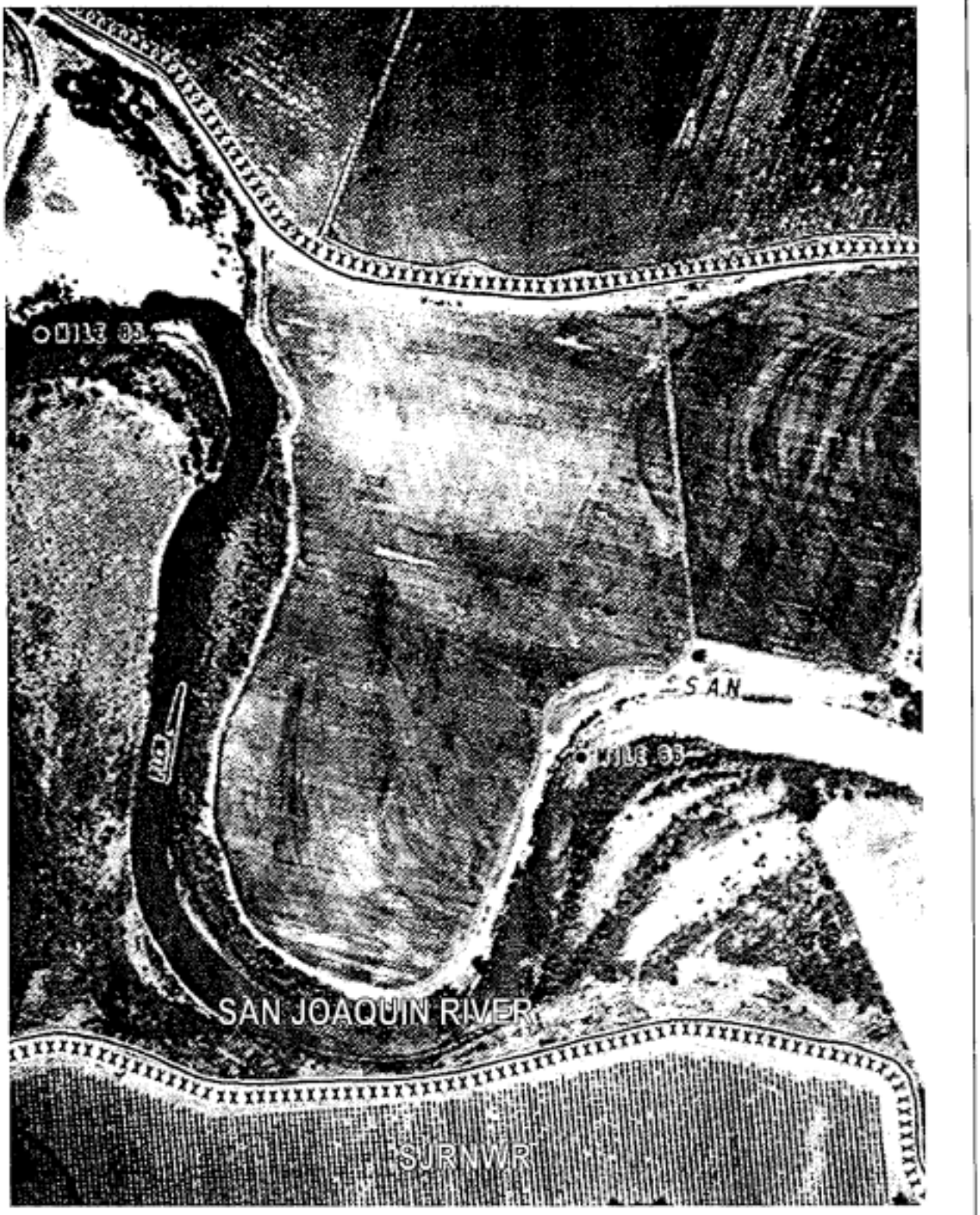
San Joaquin NWR loc map.cdr

PWA

figure 2

San Joaquin River NWR

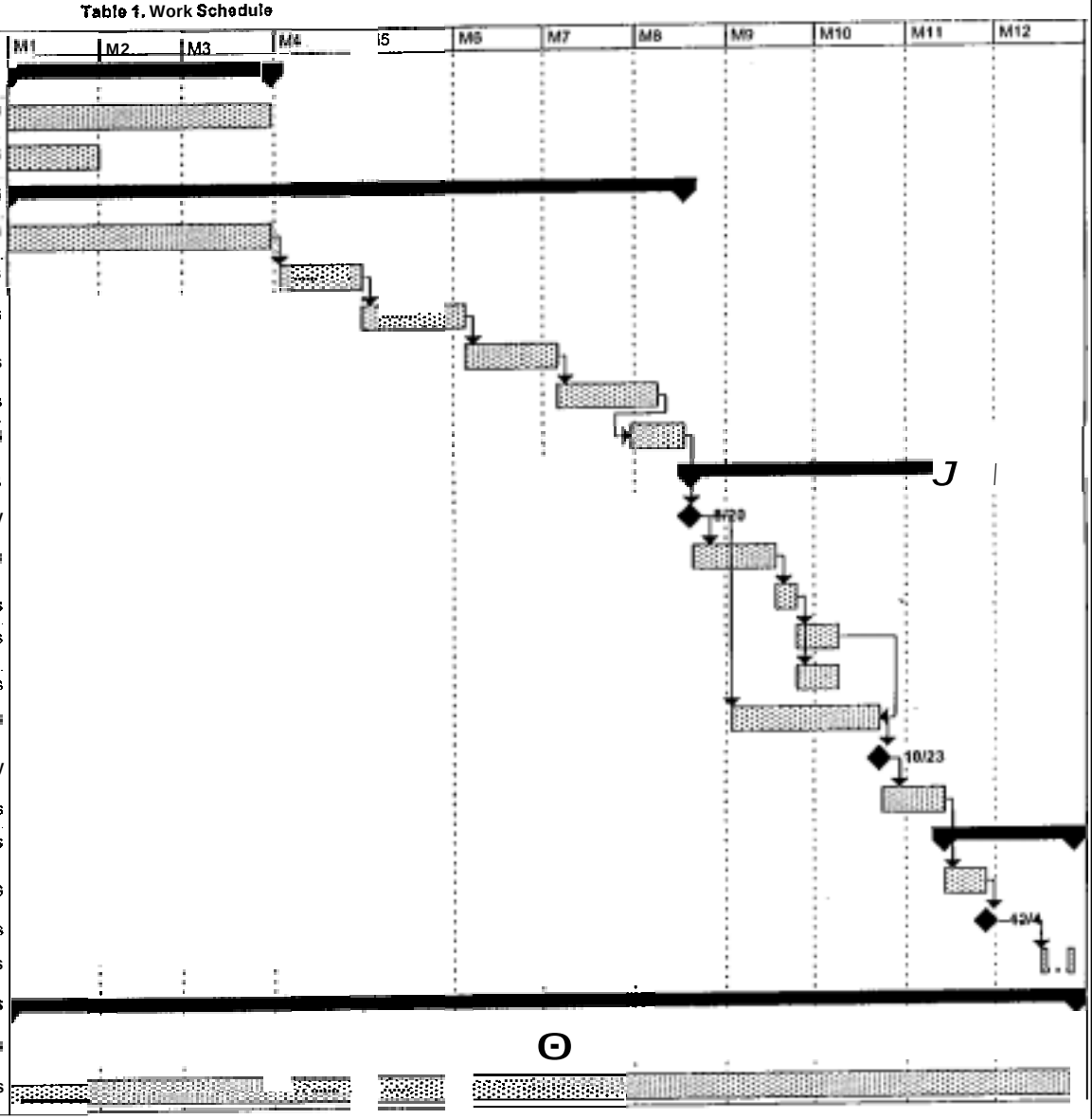
1976 Partial Aerial View (pre-1997 flood)



PWA

Table 1. Work Schedule

ID	Task Name	Duration
1	**Task 1.** Project **Initiation**	65 days
2	1.1 Revise baseline model	65 days
3	**1.2** Organize technical and expert **panels**	23 days
4	Task **2.** Formulate, Simulate, Evaluate Alternatives	165 days
5	**2.1 Solicit** input on **alternatives,** evaluation criteria	65 days
6	2.2 Formulate alternatives and disseminate	20 days
7	**2.3** Assemble models of alternatives	25 days
8	2.4 Perform simulations	23 days
9	**2.5** Analyze simulation results	24 days
10	**2.6Draft** hydraulic monitoring pian	14 days
11	Task 3. Develop Final Recommendations	62 days
12	**3.1** Present interim results	1 day
13	**3.2** Formulate, simulate, evaluate additional alternative	20 days
14	**3.3** Identify recommended **alternative(s)**	5 days
15	**3.4** Develop revised **flow** regime recommendation	10 days
16	**3.5** Prepare final hydraulic monitoring **plan**	10 days
17	3.6 Prepare Draft Final Report	36 days
18	**3.7** Distribute Draft Final Report	1 day
19	**3.8** Draft Report review	15 days
20	**Task 4.** Develop and Disseminate Final **Results**	32 days
21	4.1 Prepare Final Report	10 days
22	4.2 Submit Final Report and Publish on WWW	5 days
23	**4.3** Presentations	4 days
24	Task 5. Project Management	260 days
25	5.1 Quarterly Reports	130 days
29	5.2 Coordination	260 days



JRNWR NSA Refinement
ate: Wed 5/10/00

CALFED 2001 PSP
Work Schedule

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary

Attachment "A"

PREVIOUS CALFED AND CVPIA FUNDING

Project Name:	CALFED Number?	Financial Status		Current Status
Lower Butte Creek Project: Phase II – Preliminary Engineering and Environmental Analysis for Butte Sink Structural Modifications and Flow-through System	99-BO2	Expenditure: Income: Ducks Unlimited Inc.:	$35,549.83 $25,621.22 $9,928.61	Ongoing Consultants hired Kick **off** meeting completed Field work on design in progress
Gorrill Dam Fish Screen	96-M22	Expenditure: Income: Ducks Unlimited Inc.:	$1,548,907.86 $1,523,047.43 $25,860.43	Monitoring
M & T/Parrott, Pumping Station and Fish Screen	95-M05	Expenditure: Income: Ducks Unlimited Inc.:	$4,749,845.92 $4,530,556.71 $219,289.21	Complete
Rancho Esquon/Adamas Dam Fish Screen	96-M21	Expenditure: Income: Ducks Unlimited Inc.:	$1,151,326.33 $1,034,780.62 $116,545.71	Monitoring

Project Name:	CVPIA Number:	Financial Status		Current Status
Lower Butte Creek Project, Phase III – Butte Creek, Drumheller Exclusion Barrier Final Engineering, Pernutting and Construction	1448-11332-9JOO6	Exnenditure: Income: Ducks Unlimited Inc.:	$0 $0 $0	Engineering Consultant hired Field work-in progress
Lower Butte Creek Project, Phase II – Butte Creek, Butte Sink/Sutter Bypass Stakeholder Coordination/Facilitation	113329-9-5135	Expenditure: Income: Ducks Unlimited Inc.:	$44,419.82 $44,436.11 $16.29	Ongoing
Lower Butte Creek Project, Phase II – Butte Creek, Sutter Bypass East-West Diversion Dam Preliminary Engineering and Environmental Review	113329-9-J122	Expenditure: Income: Ducks Unlimited Inc.:	$145,667.45 $107,074.95 $38,592.50	Preliminary designs complete Environmental review started
Lower Butte Creek Project, Phase II – Butte Creek, Sutter Bypass Weir #5 Preliminary Engineering and Environmental Review	11332-9-J122	Expenditure: Income: Ducks Unlimited Inc.:	$145,667.45 $107,074.95 $38,592.50	Preliminary designs complete Environmental review started
Lower Butte Creek Project, Phase II – Butte Creek, Sutter Bypass Weir #3 Preliminary Engineering and Environmental Review	113329-9-J136	Expenditure: Income: Ducks Unlimited Inc.:	$145,667.45 $107,074.95 $38,592.50	Preliminary designs complete Environmental review started

* Philip Williams &Associates, a participant in this proposed effort, has also participated in previously funded CALFED projects but has not been a primary applicant

ATTACHEMENT "B"

QUALIFICATIONS

Dan Connelly, will serve as the Project Director. His duties will include contract administration, submitting quarterly reports, participating in project coordination, participating and arranging for additional technical input in various panels, and assisting in presentations.

Mr. Connelly has spent his entire career dealing with complex wildlife issues. He has often served as the lead in organizing diverse interest groups to design implement and evaluate a wide variety of research and management programs on an international basis. In his current capacity as coordinator for DU's Valley Bay CARE he works closely with engineering staff to design and implement complex wetland projects.

Educated at the University of Nevada, Reno with a Bachelor of Science degree and graduate work at Cal State University, Fresno in Wildlife Biology, he has spent over 29 years dealing with complex wildlife related issues. Mr. Connelly is currently employed by Ducks Unlimited, Inc. (DU) as the overall program coordinator for wetland and associated habitat delivery program in the Central Valley of California, He recently joined DU after a 27 year career with the California Department for Fish and Game where he conducted waterfowl and wetland research as well as administering the statewide program for Waterfowl and Upland Game.

(Elizabeth) **Betty** Andrews, P.E., will act as the Technical Manager for the project, overseeing the PWA staff contributions to the effort and advising the Project Manager on technical aspects of the overall project.

She has expertise in the areas of floodplain restoration, river management and modeling, and flood hazard management. An example of her work in this multi-objective arena is the development of a 1997 floodplain restoration assessment and plan for The Nature Conservancy on the Cosumnes River in California. She is also a member of the Floodplain Management Association, and has overseen several large flood hazard studies for the Federal Emergency Management Agency, and has worked with both the US Fish and Wildlife Service and the US Bureau of Reclamation on water management planning for implementation of the Central Valley Project Improvement Act.

Ms. Andrews received an MS from the University of California at Davis in Civil Engineering, specializing in Water Resources, in 1989. She is a registered engineer in the State of California, and is a Principal at PWA.

Her related publications include the following:

Andrews, E.S., 1999. Identification of an Ecologically-based Floodway: The Case of the Cosumnes River, California. *In:* Mamott, *S.,* Alexander, J. and Hey, R. (eds.). *Floodplains: Interdisciplinary Approaches.* Geological Society, London, Special Publications, **163,** 99-110.

Vick, J. and E.S. Andrews (PWA Report), 1997. Analysis of Opportunities for Restoration a National Flood Regime on the Cosumnes River Floodplain. For The Nature Conservancy, PWA Report #1148.

Andrews, E.S., and P.B. Williams, 1997. Flood Management and Ecological Enhancement Goals on the Cosumnes River, ***Linkages,*** Institute for Ecological Health, Issue No.4.: 6-8, .Spring.

Bo Juza, Ph.D. will act as PWA's chief modeler for the project. He is an experienced user of the MIKE 11 software system. Dr. Juza is a Civil Engineer specializing in the use of computational hydraulics. He has extensive experience with various 3-D, 2-D and I-D mathematical models used for flood hazard, sediment transport and environmental assessment studies, including surface, subsurface and groundwater flow, water quality, eutrophication, cohesive and non-cohesive sediment transport and rainfall-runoff modeling. He is a specialist,in the use of computational modeling software and has received training at DHI, Denmark, for mathematical modeling of non-cohesive and cohesive materials in rivers, global hydrologic modeling, and 1-D vertical hydrodynamic layer model for lakes and reservoirs. **As** a post-doctoral researcher at Columbia University, he developed new approaches in tidal hydrodynamic models used in analyzing water quality and sediment transport management in New York Harbor. He led PWA's modeling efforts in the application of MJKE 11 to simulation of ecosystem enhancement alternatives at The Nature Conservancy's Williamson River Delta preserve at Klamath Lake in Oregon and at Bair Island in South San Francisco Bay.

Dr. Juza received his Ph.D. in Civil Engineering from the Czech Technical University, Prague, Czech Republic in 1997 before joining PWA as a senior hydrodynamics modeler. He had previously received his M.Eng. from the Czech Technical University in 1990, then joined the HYDROINFORM consulting firm in Prague where he eventually became the Managing Partner of the Water Resource Division before beginning his doctoral degree program.

His related publications include the following:

PWA, 2000. Proposed action plan for the restoration of the Williamson River Delta Preserve River Corridor. Prepared for The Nature Conservancy. PWA Report #1344.

PWA, 2000. Bair Island Restoration and Management Plan: Existing Hydrologic Conditions Assessment. For H.T. Harvey & Associates. PWA Report #1413-3.